

ATCA-8320

DSP Based Media Processing Blade For AdvancedTCA™ Systems

■ Embedded Computing for Business-Critical Continuity™

Media processing blade, based on Octasic Vocallo DSP technology, providing high density IP voice conversion and up to 1080p video transcoding capability.

- Single slot AdvancedTCA blade with 10G fabric
- Up to 24 Octasic OCT2224M DSPs on two mezzanine sites
- Freescale QorIQ P4080 for blade management, packet processing and load balancing of IP streams
- Dual core Intel® Core™ i7 processor for local control and management application
- Local Ethernet switching network with full switch management utilities
- Rear transition module supports direct Ethernet cable terminations
- Designed for NEBS Level 3 and ETSI telecom standards compliance in a CP-TA B.4 class ATCA enclosure

The Emerson Network Power ATCA-8320 is a DSP-based media processing blade for use in AdvancedTCA systems. It offers a very high density of IP voice and video transcoding, including H.264 at up to 1080p, for use in communications applications.

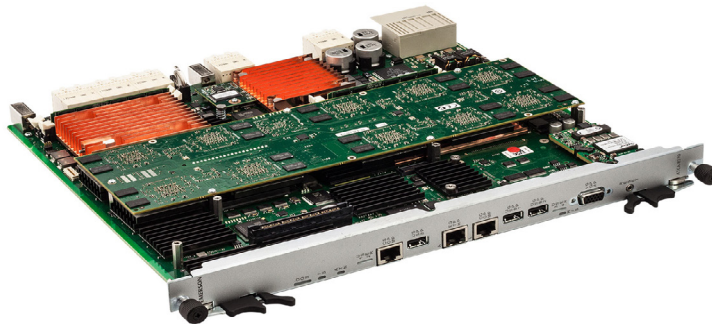
Voice and video streaming over IP networks is becoming more pervasive as customer demand for media consumption continues to rise, and the diversity of media sources, network conditions and individual consumption devices proliferate. Using traditional Intel® Xeon® server architectures, power and efficiency soon become a limitation when scaling voice and especially HD video stream processing to high channel densities. By employing efficient Octasic OCT2224M Digital Signal Processors (DSPs) to provide the transcoding functions, the new ATCA-8320 media processing blade can take the place of many additional server blades when adding voice or video processing to an application.

The blade can be used as an offload function for a standard server blade, but can also be used as the basis for a standalone media processing function. In addition to the DSPs, the ATCA-8320 blade features an integrated multicore CPU to provide advanced IP flow management and distribution, and an x86 CPU for local application hosting. This “Gateway on a Blade” architecture allows a high degree of scalability from very small systems up to very large.

This board is particularly suited to the following applications:

- Session Border Controllers (adding voice or video transcode)
- Media Gateways
- Media Servers / Media Resource Function
- Mobile Video Optimization (transcode and transrating)
- Video Communications and Conferencing Servers
- Interactive Voice and Video Response Systems

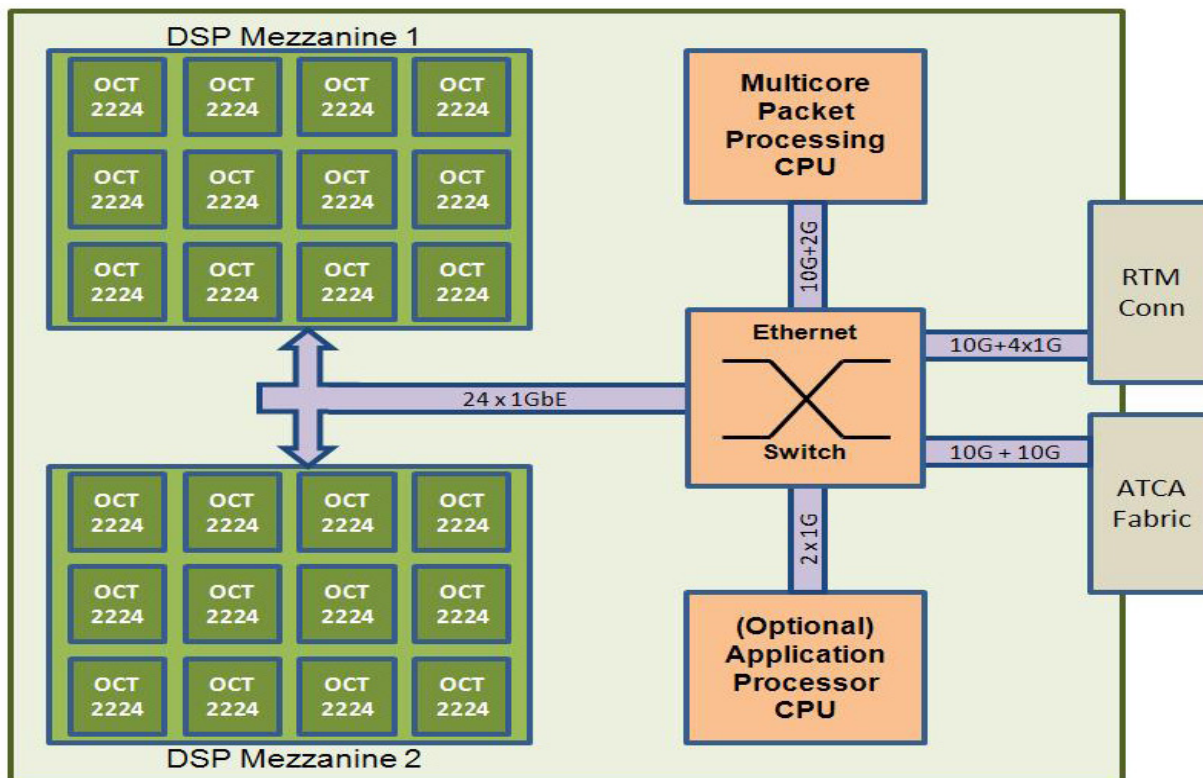
ATCA-8320 brings multi-core DSPs and the powerful Vocallo MGW voice and video software stacks together with Emerson’s leading ATCA system heritage and thermal design skill, resulting in an industry-leading media processing density for the next generation of ATCA-based voice and video processing systems.



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Overview and Block Diagram



ATCA-8320 is a PICMG 3.0/3.1 compliant AdvancedTCA blade designed for high density IP media processing applications. It offers a unique combination of processor technologies designed to maximize the flow processing and management capability of a single blade.

The ATCA-8320 utilizes a base board and DSP mezzanine module approach. In addition to maximizing flexibility and scalability, this also supports the insertion of new technology as it becomes available. At the heart of the board is a Freescale P4080 integrated multicore packet processing CPU and a Layer 2/3 Ethernet switch that interconnects all the various processing elements and provides access to a redundant 10G ATCA backplane network. The P4080 implements powerful security and load balancing functions that hide the complexity of the DSP voice and video processing subsystem from external networks.

The ATCA-8320 can be equipped with up to 24 Octasic OCT-2224M DSPs using one or two field-upgradeable mezzanines. Using mezzanines allows for low entry costs and pay-as-you-grow scalability, and a range of performance points will be available to choose from. All the DSPs on each individual mezzanine are additionally connected

using a private Ethernet switch for additional data sharing. This feature allows implementation of multi-party video conferences using HD 1080p video. Various performance points are available to better match to installation needs. These are differentiated by the number of DSPs on the mezzanine and selection of either voice only or voice + video firmware.

The board offers an optional Intel® Core™ i7 processor subsystem that, when fitted, allows the board to operate as a fully functional “media gateway on a blade” for small systems. The Intel Core i7 processor can run both management and call agent applications from an on-board SSD drive, and is certified for use with Red Hat Enterprise Linux. It avoids the need for additional ATCA blades to perform this task, again minimizing the cost to first call. The blade supports direct access to this processor via USB, Ethernet and VGA ports on the front panel.

Direct Ethernet cable termination is possible on a Rear Transition Module. This supports both 10G and 1G cable options. The board also supports full ATCA clock synchronization and recovery from a variety of channelized TDM terminations as customer-specific options.

Vocallo Media Processing Functions

TRANSPORT AND ENDPOINT SUPPORT

- Voice and Video over IP Endpoints
 - ▲ RTP/UDP/IP endpoint
 - ▲ IPv4 with DHCP & IPv6
 - ▲ Secure RTP
 - ▲ Adaptive Jitter Buffer
 - ▲ Supports RTCP [RTCP-XR in 2013]
 - ▲ CALEA / Lawful Intercept support
- Line Echo Cancellation and Voice Quality Enhancements
 - ▲ G.168 (2004) compliant line echo cancellation with 128ms tail
 - ▲ HLC & Music Protection
 - ▲ Manual and Automatic Level Control (G.169)
 - ▲ Acoustic Echo Control (AEC)
 - ▲ Adaptive Noise Reduction (ANR)
 - ▲ Natural Level Enhancement (NLE)
- Endpoint Statistics
 - ▲ RTP/UDP/IP per channel and per port packets and errors
 - ▲ Per channel/port states, terminations used, media stream events

AUDIO STREAM PROCESSING

- 3GPP / 3GPP2 Wireless Voice Codecs
 - ▲ GSM Adaptive Multi-Rate (AMR)
 - ▲ GSM Enhanced Full Rate (EFR)
 - ▲ GSM Wideband AMR-WB (G.722.2)
 - ▲ EVRC and EVRC-B [available in 2013]
- ITU-T, IETF, and other Voice Codecs
 - ▲ G.711 μ -law/A-law with Appendices I and II
 - ▲ Silence Suppression with spectral Comfort Noise Generation
 - ▲ Clear Channel Operation
 - ▲ G.729AB, G.729.1
 - ▲ G.723.1A, G.726, G.727
 - ▲ G.722, G.722.1
 - ▲ T.38 Fax Relay
 - ▲ V.152 Voice Band Data
 - ▲ iLBC
 - ▲ SILK (Skype codec) [available in 2013]
 - ▲ SPEEX Narrow Band and Wide Band [planned for 2013]
- In-band Announcements and Signaling Support
 - ▲ Announcements & Message Playback
 - ▲ Tone Detection, Generation, Removal
 - ▲ SS5, MFR1, MFR2, DTMF
 - ▲ Tone Relay (RFC 2833/4733)
 - ▲ Caller ID Generation and Detection (ETSI, BellCore & NTT)
- N-way Audio Conferencing
 - ▲ All channels on a DSP can participate in one or many conferences
 - ▲ Noise Reduction for Conferencing
 - ▲ Prime Speaker detection
 - ▲ Conference Supervisor function

VIDEO STREAM PROCESSING

- Video Encoder/Decoder Support
 - ▲ H.263 profile 0 (baseline) and 3 level 10, 20, 30, 40, 45 and 50 (CIF/QCIF) RFC4629
 - ▲ MPEG-4 simple profile, single object level 0, 1, 2 and 3 (CIF/QCIF) RFC3016
 - ▲ H.264 baseline profile level 1, 1b, 1.1, 1.2, 1.3 (CIF/QCIF) level 2.2 (VGA), 3.2 (720p) and 4.2 (1080p) RFC3984

- Scaling and Adaptation
 - ▲ Advanced-CBR, CBR and VBR rate controllers
 - ▲ Frame rate adaptation up to 30 FPS / channel
 - ▲ Scaling between resolutions, from SQCIF to 1080p
 - ▲ Packet loss concealment
 - ▲ A/V Synchronization (Lip Sync) via delay compensation
- Video conferencing / mixing support
 - ▲ Video MCU function
 - ▲ Voice Activity based source selection
 - ▲ Graphics overlay with key color
 - ▲ Video mix: up to 16 layers per stream for video or graphics

ATCA-8320 Technical Specifications

HARDWARE

- AdvancedTCA Single Slot Blade
 - ▲ PICMG 3.0: 8U form factor blade (280mm x 322mm) with full IPMI
 - ▲ PICMG 3.1 Fabric: Option 1 (1G) and Option 9 (10G) dual star, fully redundant
 - ▲ PICMG 3.0 Update channel: 1G Ethernet
- Digital Signal Processing Core
 - ▲ DSP mezzanine with up to 12 OCT2224M DSPs running Vocallo MGW firmware
 - ▲ Two mezzanine sites available on board
 - ▲ On-mezzanine private Ethernet switch
- Integrated Muticore Packet Processing CPU
 - ▲ Freescale P4080 8 core @ 1.5GHz
 - ▲ 2GB DDR3 memory via two 244-pin Mini-DIMM sockets (with ECC)
 - ▲ 4GB user flash memory
 - ▲ 1 x COM + 1 x USB front panel connection
- Application Processor Subsystem (optional)
 - ▲ Intel Core i7-620LE @ 2.0GHz
 - ▲ 4GB DDR3 memory via two 244-pin Mini-DIMM sockets (with ECC)
 - ▲ 1.8" Solid State Drive option
 - ▲ 1xcomm, 2 x USB, GbE, VGA ports on front
- Ethernet Switching Infrastructure
 - ▲ 1 x 1GbE to each DSP
 - ▲ 10GbE + 2 x 1GbE to P4080
 - ▲ 2 x 1GbE to Core i7
 - ▲ 2 x 10GbE + 2 x 1GbE to ATCA Backplane
 - ▲ 1 x 10GbE + 4 x 1GbE to Rear Transition
- Rear Transition Module (ARTM-831X-IP)
 - ▲ 1 x 10Gb/s Ethernet via SFP+ cage
 - ▲ 4 x 1000BASE-T Ethernet via RJ45

SYSTEM REQUIREMENTS

- Board Power Requirement
 - ▲ Dual Redundant -48V to -60VDC (TNV-2)
 - ▲ Input Range: -39 to -72VDC
 - ▲ Power consumption estimate: up to 270W
- Board Thermal Characteristics
 - ▲ Operating Range: -5C to +55C ambient
 - ▲ Cooling requirement: CP-TA B.4 system
- Supported Deployment Environments
 - ▲ Emerson Centellis 2000 and 4000 family of CP-TA B.4 class ATCA platforms

Technical Specifications (contd.)

BOARD SOFTWARE ENVIRONMENT

- Multicore Packet Processing CPU (board controller)
 - ▲ Mentor Graphics Linux BSP
 - ▲ Wind River Linux 4.x BSP (by request)
 - ▲ Emerson Basic Blade Services for ATCA-8320
 - ▲ All necessary device drivers
 - ▲ Control, boot, mgmt of DSPs
 - ▲ Firmware upgrade utility
 - ▲ IPMI support
 - ▲ SRStackware Switch Management
 - ▲ Packet Forwarder supporting NAT
 - ▲ CLI and SNMP user interfaces
- Application Processing CPU
 - ▲ Full driver package for RHEL
 - ▲ Vocollo APIs
- DSP Programmers Environment
 - ▲ Octasic Vocollo API set and documentation
 - ▲ Octasic Debug Tools

Principal Part Ordering Details

Part Number	Description
ATCA-8320-0-T0	ATCA BLADE - P4080/2GB - no I7-620LE - no DSP - 2 FREE MODULE SLOTS - SW LICENSES: P4080 BBS
ATCA-8320-IA-T0	ATCA BLADE - P4080/2GB - I7-620LE/4GB - no DSP - 2 FREE MODULE SLOTS - SW LICENSES: P4080 BBS
ATCA-8320-IA-O12	ATCA BLADE - P4080/2GB - I7-620LE/4GB - 12 X OCT2224M/512MB - 1 FREE MODULE SLOT - SW LICENSES: VOICE, P4080 BBS
ATCA-8320-IA-V12	ATCA BLADE - P4080/2GB - I7-620LE/4GB - 12 X OCT2224M/512MB - 1 FREE MODULE SLOT - SW LICENSES: VOICE, BASIC VIDEO, P4080 BBS
8320-MEZZ-O5 / -O9 / -O12	DSP MODULE FOR ATCA-8320 - 5 / 9 / 12 X OCT2224M/512MB - SW LICENSES: VOICE
8320-MEZZ-V5 / -V9 / -V12	DSP MODULE FOR ATCA-8320 - 5 / 9 / 12 X OCT2224M/512MB - SW LICENSES: VOICE, BASIC VIDEO
ARTM-831X-IP	REAR TRANSITION MODULE WITH 1X10GE-4X1GBE










SOLUTION SERVICES

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